



RELEASED ITEMS

**MATHEMATICS
GRADE 7**

Fall 2008

**MICHIGAN STATE BOARD OF EDUCATION
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PART 1

DIRECTIONS

This test has two parts. You may **NOT** use a calculator on Part 1. You may use open space in this test booklet for scratch paper. No additional paper may be used.

Part 1 has only multiple-choice questions. You must choose the *best* answer from among four answer choices.

- Use only a No. 2 pencil to mark your answer in your **Answer Document**.
- If you erase an answer, be sure to erase it completely.
- If you skip a question, be sure to mark the answer to the next question in the correct place in your **Answer Document**.

Sample Multiple-Choice Question:

Marty wants to put 75 CDs into cases. Each case holds exactly 8 CDs. What is the *least* number of cases that Marty will need to hold all his CDs?

- A 8
- B 9
- C 10
- D 11

For this sample question, the correct answer is **C**. Circle **C** is filled in on the sample question in your **Answer Document**.

You will have at least 35 minutes to finish Part 1 of this test. You will be given additional time if necessary.

Once you have reached the word **STOP** in your test booklet, do **NOT** go on to the next page.

If you finish early, you may check your work in Part 1 of the test **ONLY**. Do **NOT** look at questions in Part 2 of the test.

- 1** Understand \div of fractions as the inverse of \times
- A** multiplication = division
 - B** division = reciprocal \times reciprocal
 - C** correct
 - D** division = reciprocal \times fraction
- 2** Which of the following is the same as division by a fraction?
- A** adding by the reciprocal of the fraction
 - B** subtracting by the reciprocal of the fraction
 - C** dividing by the reciprocal of the fraction
 - D** multiplying by the reciprocal of the fraction
- 3** Write a statement to represent dividing fractions
- A** multiplication
 - B** correct
 - C** addition
 - D** subtraction

4 Which of the following has the same value as $\frac{5}{7} \div \frac{2}{3}$?

A $\frac{5}{7} \cdot \frac{3}{2}$

B $\frac{7}{5} \cdot \frac{2}{3}$

C $\frac{5}{7} \cdot \frac{2}{3}$

D $\frac{7}{5} \cdot \frac{3}{2}$

5 \times and \div any two fractions, including mixed numbers

A correct

B added numerators

C added denominators

D added numerators and denominators

6 Divide $\frac{2}{3} \div \frac{1}{6}$

A $\frac{2}{18}$

B $\frac{3}{12}$

C 3

D 4

7 Compute with positive rational numbers

- A incorrect computation
- B incorrect computation
- C correct
- D incorrect computation

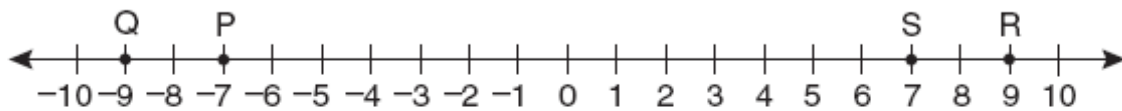
8 Multiply $\frac{2}{3} \cdot \frac{3}{4}$

- A $\frac{5}{12}$
- B $\frac{1}{2}$
- C $\frac{5}{7}$
- D $\frac{8}{9}$

9 Locate negative rational numbers on number line

- A positive rational number
- B incorrect point
- C incorrect point
- D correct

- 10 Which point on the number line best represents a value of 1 more than -8 ?



- A P
B Q
C R
D S
- 11 Understand congruence for polygons
- A incorrect conclusion about side lengths
B correct
C incorrect conclusion about angle measure
D incorrect conclusion about angle measure
- 12 The figures shown below are congruent.



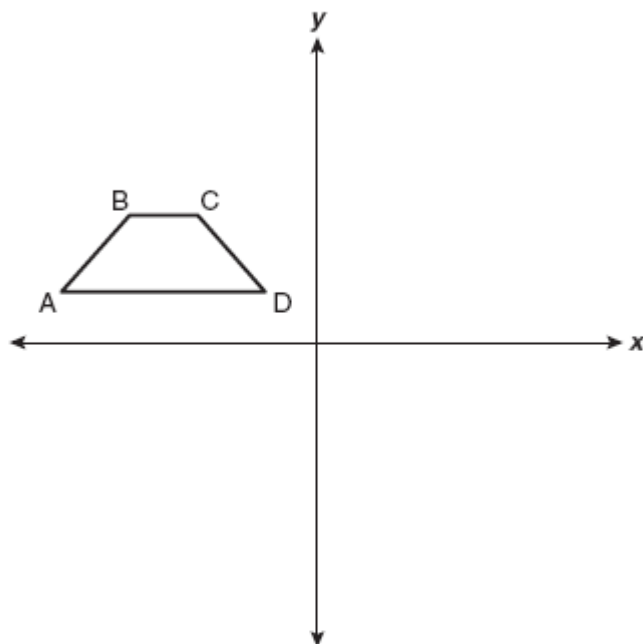
Which is true about their corresponding sides and corresponding angles?

- A The corresponding angle measures are equal, but not the corresponding side lengths.
B The corresponding side lengths are equal, but not the corresponding angle measures.
C The corresponding angle measures and corresponding side lengths are not equal.
D The corresponding angle measures and the corresponding side lengths are equal.

13 Understand rigid motions & relate to congruence

- A correct
- B rotation
- C translation
- D rotation

14 If trapezoid ABCD is reflected over the y -axis, which of the following statements would be true of the reflected figure?



- A The perimeter would increase and the area would decrease.
- B The perimeter and area would remain the same.
- C The perimeter and area would decrease.
- D The perimeter and area would increase.

15 Plot ordered pairs of integers

- A** correct
- B** (y, x)
- C** $(x, -y)$
- D** $(-y, x)$

16 In which quadrant of a coordinate plane is point $(2, -6)$ located?

- A** I
- B** II
- C** III
- D** IV

17 Use letters with units to represent quantities

- A** addition
- B** subtraction
- C** division
- D** correct

18 The temperature at 1:00 p.m. on Tuesday was -13°C . There was an increase of 6°C per hour starting at 1:00 p.m. Which of the following best represents the Celsius temperature n hours after 1:00 p.m. on Tuesday?

- A** $-13 + (6n)$
- B** $-13 - (6n)$
- C** $(-13n) + 6$
- D** $(-13n) - 6$

- 19 Relate simple linear equations to contexts; solve
- A correct
 - B subtraction
 - C addition
 - D multiplication
- 20 An agency charges a one-time fee of \$2.00 to anyone buying tickets to a concert, plus a \$5.00-per-ticket fee (in addition to the face-value cost of the ticket). Which of the following best describes c , the total cost of the fees, in dollars, for buying 5 tickets?
- A $c = 2 \cdot 5 + 5$
 - B $c = 2 + 5 + 5$
 - C $c = 2 + 5 \cdot 5$
 - D $c = 2 \cdot 5 \cdot 5$
- 21 Add, subtract numbers on both sides of equations
- A same left side of equation
 - B same variables, constants but changed operation
 - C same right side of equation
 - D correct
- 22 Which is **NOT** equivalent to the statement shown below?
- $$18 + x = 20$$
- A $18 + x - x = 20 + 18$
 - B $18 + x + 20 = 20 + 20$
 - C $18 + x + 18 = 20 + 18$
 - D $18 + x - 18 = 20 - 18$

23 Multiply, divide numbers on both sides of equations

- A** divided only one side of equation
- B** correct
- C** subtracted from one side, divided the other side
- D** subtracted from one side, multiplied the other side

24 Which of the following operations solve the equation below in one step?

$$\frac{n}{3} = 81$$

- A** Add 3 to $\frac{n}{3}$ and 81.
- B** Subtract 3 from $\frac{n}{3}$ and 81.
- C** Multiply $\frac{n}{3}$ by 3 and 81 by 3.
- D** Divide $\frac{n}{3}$ by 3 and 81 by 3.

25 What is 15% of 20?

- A** 1
- B** 3
- C** 30
- D** 35

26 Which best describes the set of non-zero rational numbers?

- A positive fractions only
- B negative fractions only
- C neither positive nor negative fractions
- D both positive and negative fractions

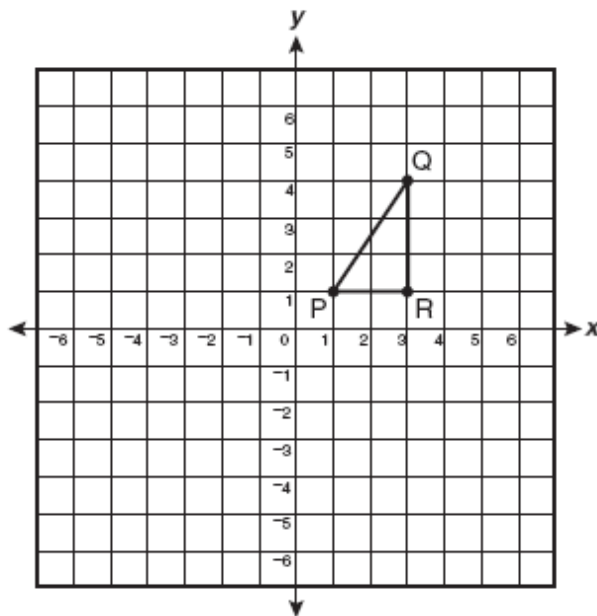
27 Which of the following is neither negative nor positive?

- A -1
- B 0
- C $\frac{1}{2}$
- D 1

28 What is the value of $|-8|$?

- A -8
- B $-\frac{1}{8}$
- C $\frac{1}{8}$
- D 8

- 29 If triangle PQR is reflected over the x -axis and translated 2 units to the right, which appear to be the new coordinates of point Q?



- A $(-3, 4)$
B $(-1, 4)$
C $(3, -4)$
D $(5, -4)$
- 30 Which of the following is an algebraic equation?

- A $x + 4$
B $2x + 4$
C $x^2 = 9$
D $x + 4 + 2y$

PART 2

DIRECTIONS

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- B 9
- C 10
- D 11

For this sample question, the correct answer is **C**. Circle **C** is filled in on the sample question in your **Answer Document**.

You will have at least 40 minutes to finish Part 2 of this test. You will be given additional time if necessary.

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31 Find equivalent ratios by scaling up or down

- A incorrect scaling
- B incorrect scaling
- C incorrect scaling
- D correct

32 Which fraction is equivalent to $\frac{3}{8}$?

- A $\frac{2}{7}$
- B $\frac{6}{16}$
- C $\frac{4}{9}$
- D $\frac{6}{8}$

33 Solve contextual problems involving percentages

- A added % to dollar amount
- B correct
- C added % to cents amount
- D incorrect computation

- 34 Misha bought a dress for \$35.95 and a hat for \$12.98. If the sales tax was 6%, what is the total price Misha should have paid for the dress and hat?
- A \$29.36
 - B \$51.01
 - C \$51.87
 - D \$79.89
- 35 Estimate calculations involving rational numbers
- A correct
 - B overestimate
 - C overestimate
 - D overestimate
- 36 Six friends went to an amusement park. Each amusement park pass cost \$27.95. Which is closest to the total cost for all 6 passes?
- A \$140
 - B \$168
 - C \$180
 - D \$190
- 37 Solve applied problems with appropriate decimals
- A reciprocal
 - B incorrect computation
 - C correct
 - D incorrect computation

- 38 A rectangle has a length of 3.7 inches and a width of 3.5 inches. What is the area of the rectangle?
- A 7.2 sq in.
 - B 12.95 sq in.
 - C 14.40 sq in.
 - D 16 sq in.
- 39 Convert measures within a single system
- A divided instead of multiplied
 - B divided instead of multiplied
 - C incorrect conversion
 - D correct
- 40 How many gallons are equivalent to 20 quarts?
- A 80
 - B 24
 - C 5
 - D 4
- 41 Express probabilities as fractions, decimals or %s
- A incorrect fraction
 - B correct
 - C did not take size of spinner sections into account
 - D other section

- 42 Bethany will roll a fair number cube on which each face has a different numeral 1 through 6. What is the probability that she will roll a 2 on her first roll?
- A $\frac{1}{6}$
- B $\frac{2}{6}$
- C $\frac{3}{6}$
- D $\frac{6}{2}$
- 43 Solve applied problems involving rates
- A divided
- B subtracted
- C added
- D correct
- 44 On a recent trip, Stephan traveled a total of $9\frac{1}{2}$ hours at an average speed of 57 miles per hour. What was the total distance he traveled on the trip?
- A 513.5 miles
- B 518.7 miles
- C 524.4 miles
- D 541.5 miles

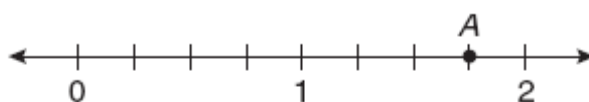
45 Represent words using algebraic equations

- A sum
- B difference
- C incorrect multiplication
- D correct

46 Karen practices on her drums the same number of hours per day. If x represents the number of hours she practices each day, which of the following represents the total number of hours she will practice in 20 days?

- A $20 + x$
- B $20x$
- C $20 - x$
- D $\frac{20}{x}$

47 Which best represents the location of point A?



- A $\frac{3}{4}$
- B $\frac{7}{8}$
- C $1\frac{3}{4}$
- D $1\frac{7}{8}$

48 Which fraction is equivalent to 0.875?

A $\frac{4}{5}$

B $\frac{6}{8}$

C $\frac{6}{7}$

D $\frac{7}{8}$

49 Libby flipped a fair coin twice. What was the probability that the coin landed with the same side facing up both times?

A 25%

B 50%

C 75%

D 100%

- 50 What is the relationship between each pair of x and y values in the table below?

x	y
-2	-1
0	0
2	1
4	2

- A** $y = -2x$
- B** $y = -\frac{1}{2}x$
- C** $y = \frac{1}{2}x$
- D** $y = 2x$
- 51 Which of the following represents "the product of x and 4, plus 3"?
- A** $4x + 3$
- B** $3x + 4$
- C** $4(x + 3)$
- D** $x + 4 + 3$
- 52 Which is equivalent to the following?
- $$6x + 24 - 3x$$
- A** $3x + 24$
- B** $9x + 24$
- C** $6x + 21$
- D** $33x$

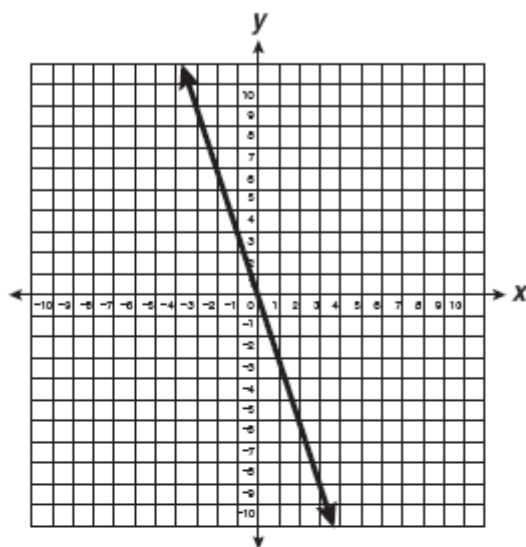
- 53 What value of x makes the following true?

$$2x + 8 = 15$$

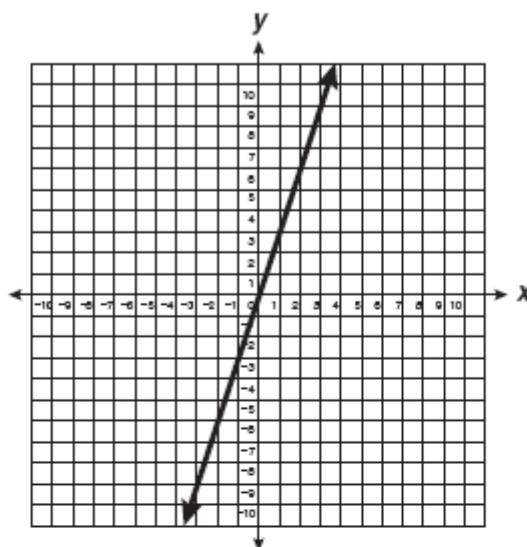
- A 3.5
- B 5
- C 11.5
- D 14

- 54 Which graph best represents $y = -\frac{1}{3}x$?

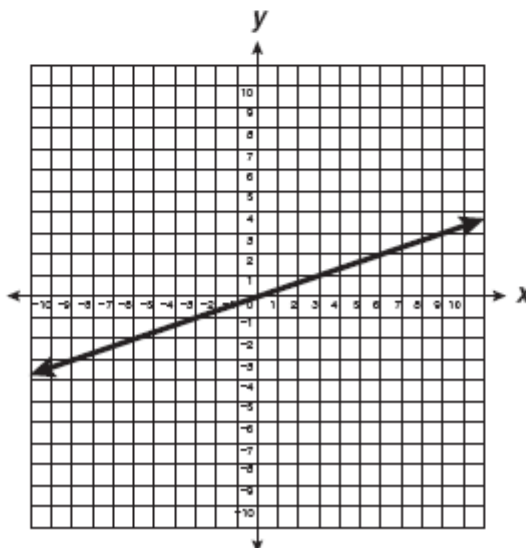
A



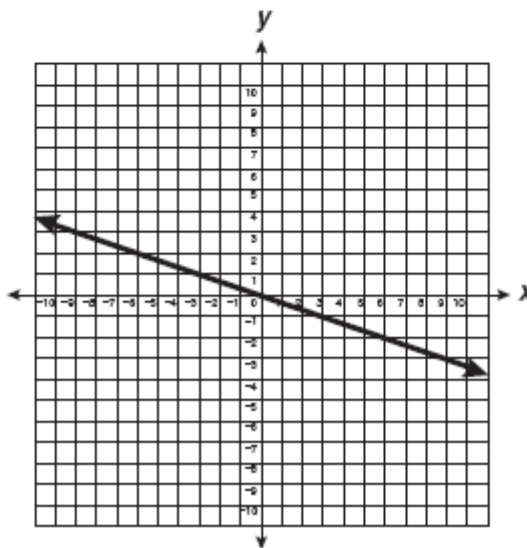
B



C



D



55 Which of the following represents the relationship between x feet and y inches?

A $y = \frac{1}{12}x$

B $y = \frac{1}{3}x$

C $y = 3x$

D $y = 12x$

56 Which of the following describes an angle that measures 120 degrees?

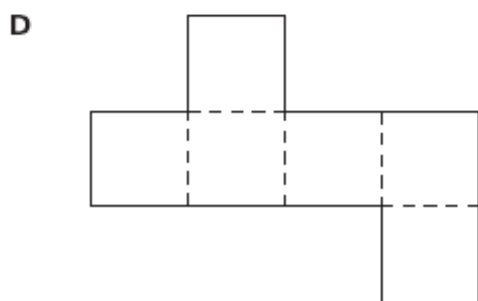
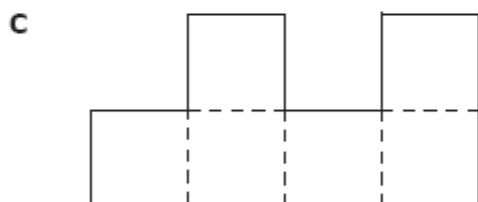
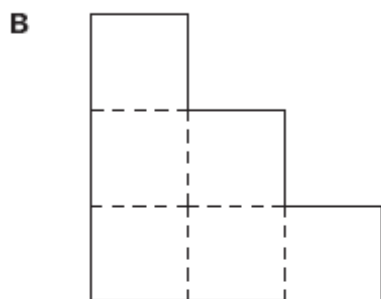
A acute

B right

C straight

D obtuse

- 57 Which of the following is a net of a cube?



- 58 What is the surface area of a cube with an edge length of 4 centimeters?

$$SA = 6 \times (\text{length of edge})^2$$

- A** 16 square centimeters
B 24 square centimeters
C 48 square centimeters
D 96 square centimeters

59 Multiply $-7 \times (-3)$

- A 21
- B 10
- C -10
- D -21

60 Which is equivalent to -9 divided by 2 ?

- A -18
- B $-\frac{9}{2}$
- C $-\frac{2}{9}$
- D 18

61 What is the value of 3.6×10^{-4} ?

- A 0.00036
- B 0.0036
- C 3,600
- D 36,000

- 62 What number goes in the box to make the following true?

$$\square \times \frac{1}{6} = 1$$

- A $\frac{1}{12}$
 - B $\frac{1}{6}$
 - C 1
 - D 6
- 63 Which of the following has the same value as $8 - (-2)$?
- A $8 + 2$
 - B $8 - 2$
 - C $-8 + 2$
 - D $-8 - 2$

Scoring Key: Part 1

Item No.	Correct Answer	GLCE	Type	Description
1	C	N.MR.06.01	Core	Understand \div of fractions as the inverse of \times
2	D	N.MR.06.01	Core	Understand \div of fractions as the inverse of \times
3	B	N.FL.06.02	Core	Write a statement to represent dividing fractions
4	A	N.FL.06.02	Core	Write a statement to represent dividing fractions
5	A	N.FL.06.04	Core	\times and \div any two fractions, including mixed numbers
6	D	N.FL.06.04	Core	\times and \div any two fractions, including mixed numbers
7	C	N.FL.06.10	Core	Compute with positive rational numbers
8	B	N.FL.06.10	Core	Compute with positive rational numbers
9	D	N.ME.06.17	Core	Locate negative rational numbers on number line
10	A	N.ME.06.17	Core	Locate negative rational numbers on number line
11	B	G.GS.06.02	Core	Understand congruence for polygons
12	D	G.GS.06.02	Core	Understand congruence for polygons
13	A	G.TR.06.03	Core	Understand rigid motions & relate to congruence
14	B	G.TR.06.03	Core	Understand rigid motions & relate to congruence
15	A	A.RP.06.02	Core	Plot ordered pairs of integers
16	D	A.RP.06.02	Core	Plot ordered pairs of integers
17	D	A.FO.06.03	Core	Use letters, with units, to represent quantities
18	A	A.FO.06.03	Core	Use letters, with units, to represent quantities
19	A	A.FO.06.11	Core	Relate simple linear equations to contexts; solve
20	C	A.FO.06.11	Core	Relate simple linear equations to contexts; solve
21	D	A.FO.06.12	Core	Add, subtract numbers on both sides of equations
22	A	A.FO.06.12	Core	Add, subtract numbers on both sides of equations
23	B	A.FO.06.13	Core	Multiply, divide numbers on both sides of equations
24	C	A.FO.06.13	Core	Multiply, divide numbers on both sides of equations
25	B	N.FL.06.12	Extended	Calculate part of a number given the % and number
26	D	N.ME.06.18	Extended	Understand that rationals are quotients of integers
27	B	N.ME.06.19	Extended	Understand that 0 is neither negative nor positive
28	D	N.ME.06.20	Extended	Know the absolute value of a number
29	D	G.TR.06.04	Extended	Use simple compositions of rigid transformations
30	C	A.FO.06.04	Extended	Distinguish between algebraic expression/equation

Scoring Key: Part 2

Item No.	Correct Answer	GLCE	Type	Description
31	D	N.ME.06.11	Core	Find equivalent ratios by scaling up or down
32	B	N.ME.06.11	Core	Find equivalent ratios by scaling up or down
33	B	N.MR.06.13	Core	Solve contextual problems involving percentages
34	C	N.MR.06.13	Core	Solve contextual problems involving percentages
35	A	N.FL.06.14	Core	Estimate calculations involving rational numbers
36	B	N.FL.06.14	Core	Estimate calculations involving rational numbers
37	C	N.FL.06.15	Core	Solve applied problems with appropriate decimals
38	B	N.FL.06.15	Core	Solve applied problems with appropriate decimals
39	D	M.UN.06.01	Core	Convert measures within a single system
40	C	M.UN.06.01	Core	Convert measures within a single system
41	B	D.PR.06.01	Core	Express probabilities as fractions, decimals or %s
42	A	D.PR.06.01	Core	Express probabilities as fractions, decimals or %s
43	D	A.PA.06.01	Core	Solve applied problems involving rates
44	D	A.PA.06.01	Core	Solve applied problems involving rates
45	D	A.FO.06.06	Core	Represent words using algebraic equations
46	B	A.FO.06.06	Core	Represent words using algebraic equations
47	C	N.ME.06.05	Extended	Order rational numbers and place on the number line
48	D	N.ME.06.06	Extended	Show rationals as fractions or terminating decimals
49	B	D.PR.06.02	Extended	Compute probabilities of events from experiments
50	C	A.RP.06.08	Extended	Relationships can be shown by graphs and tables
51	A	A.FO.06.05	Future	Use conventions for writing algebraic expressions
52	A	A.FO.06.07	Future	Simplify linear expression & evaluate using values
53	A	A.FO.06.14	Future	Solve equations of the form $ax + b = c$
54	D	A.PA.06.09	Future	Solve problems involving linear functions
55	D	A.RP.06.10	Future	Show relationships using equations, tables, graphs
56	D	G.GS.06.01	Future	Understand and apply properties of lines and angles
57	D	M.PS.06.02	Future	Draw patterns for rectangular prisms
58	D	M.TE.06.03	Future	Compute volume & surface area of rectangular prisms
59	A	N.FL.06.09	Future	Compute with integers, use # line & chip models
60	B	N.ME.06.07	Future	Understand fractions as a quotient of two integers
61	A	N.ME.06.16	Future	Use integer exponents & scientific notation
62	D	N.MR.06.03	Future	Solve for the unknown in equations
63	A	N.MR.06.08	Future	Understand - and \div as inverse of + and \times